IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for analyzing distributed temperature data from a well comprising:

using a distributed temperature sensor system to obtain temperature profile data along a portion of a wellbore;

providing the temperature profile data to a processor;

automatically determining whether fluids are flowing into or out of a tubing located in the well by processing the temperature profile data; and

highlighting valuable information to a user related to the flow of fluid relative to the tubing.

2. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises removing noise from the temperature profile data.

3. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises removing low order spatial trends.

4. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises utilizing a high-pass filter.

5. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises utilizing a low-pass filter.

6. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises applying a model-fitting algorithm to the data.

7. (Original) The method as recited in claim 6, wherein applying a model-fitting algorithm comprises selecting regions for fitting and fitting a model to data.

8. (Original) The method as recited in claim 7, wherein applying a model-fitting algorithm further comprises testing results for statistical significance.

9. (Original) The method as recited in claim 6, wherein applying a model-fitting algorithm comprises constructing a match filter and using extrema of a convolution of the filter with data to select candidate depths.

10. (Previously Presented) A method for analyzing distributed temperature data from a well, comprising:

obtaining temperature profile data along a portion of a wellbore;

providing the temperature profile data to a processor; and

automatically processing the temperature profile data to highlight valuable information to a user, wherein automatically processing comprises applying a model-fitting algorithm to the data and applying the model-fitting algorithm comprises constructing a match filter, further wherein constructing the match filter comprises incorporating modifications to the filter to make it orthogonal to background trends.

11. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises trend removal and filtering of the temperature profile data.

12. (Canceled)

13. (Canceled)

14. (Previously Presented) The method as recited in claim 1, wherein using comprises obtaining the temperature profile data with a temporary distributed temperature sensor installation.

15. (Previously Presented) The method as recited in claim 1, wherein using comprises obtaining the temperature profile data with a slickline distributed temperature sensing system.

16. (Previously Presented) The method as recited in claim 1, wherein automatically determining comprises utilizing a match filter.

17. (Original) The method as recited in claim 16, wherein the match filter is used to detect particular temperature signals corresponding to a particular downhole event.

18. (Original) The method as recited in claim 17, wherein the downhole event comprises the location of a gas lift valve.

19. (Original) The method as recited in claim 17, wherein the downhole event comprises a hole in a tubing.

20. (Original) The method as recited in claim 17, wherein the downhole event comprises a leak in a wellbore completion tool.

21. (Previously Presented) The method as recited in claim 1, wherein the automatically determining occurs in real-time with the obtaining data.

22. (Previously Presented) A system to analyze distributed temperature data from a well, comprising:

a distributed temperature sensor that measures temperature profile data along a portion of a wellbore;

a processor that receives the temperature profile data in real time, the processor being programmed to identify a particular temperature signal that corresponds to a specific downhole event having an inflow of relatively cooler fluid; and

wherein the processor outputs valuable information related to the specific downhole event to a user.

23. (Original) The system as recited in claim 22, wherein the distributed temperature system comprises an optical fiber.

24. (Original) The system as recited in claim 22, wherein the distributed temperature sensor comprises an opto-electronic unit to launch optical pulses downhole.

25. (Original) The system as recited in claim 24, wherein the opto-electronic unit is coupled to the processor by a communication link.

26. (Original) The system as recited in claim 25, wherein the communication link comprises a hardline link.

27. (Original) The system as recited in claim 25, wherein the communication link comprises a wireless link.

28. (Original) The system as recited in claim 22, wherein the processor is embodied in a portable computer.

29. (Original) The system as recited in claim 23, further comprising a production tubing deployed in the wellbore with the optical fiber.

30. (Original) The system as recited in claim 29, wherein the production tubing is combined with a gas lift system.

31. (Previously Presented) A method of detecting certain events within a well, comprising:

using a distributed temperature sensor system to obtain data related to temperature over a period of time along a portion of a wellbore;

automatically processing the data to detect specific events related to heat energy in the well;

further automatically processing the data to determine a flow rate of fluid in the well; and

displaying results to a user.

32. (Canceled)

33. (Canceled)

34. (Original) The method as recited in claim 31, wherein automatically processing comprises processing the data on a processor-based computer.

35. (Original) The method as recited in claim 31, wherein automatically processing comprises processing backscattered light signals.

36. (Original) The method as recited in claim 31, wherein automatically processing comprises applying a model-fitting algorithm to the data.

37. (Original) The method as recited in claim 36, wherein applying a model-fitting algorithm comprises selecting regions for fitting and fitting a model to data.

38. (Original) The method as recited in claim 37, wherein applying a model-fitting algorithm further comprises testing results for statistical significance.

39. (Original) The method as recited in claim 36, wherein applying a model-fitting algorithm comprises constructing a match filter and using extrema of a convolution of the filter with data to select candidate depths.

40. (Previously Presented) A method of detecting certain events within a well, comprising:

obtaining data over a period of time along a portion of a wellbore;

automatically processing the data to detect specific events related to heat energy in the well; and

displaying results to a user, wherein automatically processing comprises applying a model-fitting algorithm to the data and applying the model-fitting algorithm comprises constructing a match filter and using extrema of a convolution of the filter with data to select candidate depths, wherein constructing the match filter comprises incorporating modifications to the filter to make it orthogonal to background trends.

41. (Original) The method as recited in claim 31, wherein automatically processing comprises applying a phenomenological model to the data.

42. (Canceled)

43. (Original) The method as recited in claim 31, wherein automatically processing comprises detecting particular temperature signals corresponding to location of a gas lift valve.

44. (Original) The method as recited in claim 31, wherein automatically processing comprises detecting particular temperature signals corresponding to a wellbore completion tool leak.

45. (Original) The method as recited in claim 31, wherein automatically processing comprises detecting particular temperature signals corresponding to a hole in a production tubing.

46. (Original) The method as recited in claim 31, wherein displaying comprises displaying results in graphical form on a display monitor.

47. (Original) The method as recited in claim 31, wherein automatically processing comprises utilizing a match filter.

48. (Original) The method as recited in claim 31, wherein automatically processing occurs real-time with the obtaining data.

49. (Canceled)

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